1 Appendix 31B
2 # Mitigation Measure WQ-7e: CCWD Settlement
3 # Agreement

31B-2.2.3 Water Quality

31B-2.2.3.1 Alternative 2D (ELT)

Table 29 Water Quality Summary Table for Alternative 2D (ELT)

Alternative 2D (ELT) without mitigaiton

			Monthly Average Salinity (EC, µS/cm)											
Region	Location	Years	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Western Delta	Sacramento River at Emmaton	All	1,544	1,462	1,100	461	337	283	290	465	771	1,112	1,621	2,113
		Drought	2,205	2,200	1,796	642	498	351	324	684	1,129	1,901	2,271	3,331
	San Joaquin River at Jersey Point	All	946	1,076	1,217	601	363	301	285	353	514	1,086	1,269	1,538
		Drought	1,367	1,646	1,802	857	454	333	300	459	703	1,547	1,633	2,391
Interior Delta	South Fork Mok at Terminous	All	193	197	201	250	248	231	212	192	193	191	188	187
		Drought	193	195	200	247	261	244	217	201	196	194	190	191
	San Joaquin River at San Andreas Landing	All	392	384	452	355	272	241	250	251	260	341	383	465
		Drought	492	510	620	460	307	257	253	264	279	411	467	647
	San Joaquin River at Prisoner's Point	All	420	393	454	456	395	360	361	315	313	351	386	446
		Drought	493	480	592	533	416	431	399	336	302	391	453	560
South Delta	San Joaquin River at Vernalis	All	502	534	726	676	654	634	411	408	540	588	524	511
		Drought	570	618	810	820	939	915	554	563	636	634	626	610
	SJR at Brandt Bridge	All	503	534	714	683	655	639	433	415	546	598	536	516
		Drought	571	617	794	823	933	922	594	573	646	655	636	616
	Old River at Middle River	All	508	536	720	689	658	642	435	417	548	597	535	516
		Drought	577	619	803	829	936	925	597	576	648	651	636	617
	Old River at Tracy Bridge	All	512	536	709	738	684	663	488	432	513	563	545	527
		Drought	589	621	789	855	938	950	684	594	563	555	594	620

Change due to CCWD mitigation wheeled primarily through Freeport Intakes

				Monthly Average Salinity (EC, µS/cm)											
Region	Location	Years	Effect	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Western Delta	Sacramento River at Emmaton	All	Change	2	2	10	6	3	0	1	1	4	-4	-19	-5
			% Change	0%	0%	1%	1%	1%	0%	0%	0%	1%	0%	-1%	0%
		Drought	Change	-5	1	13	10	5	0	0	0	5	4	-15	-8
			% Change	0%	0%	1%	2%	1%	0%	0%	0%	0%	0%	-1%	0%
	San Joaquin River at Jersey Point	All	Change	1	1	10	7	3	1	1	0	1	-24	-32	-10
			% Change	0%	0%	1%	1%	1%	0%	0%	0%	0%	-2%	-3%	-1%
		Drought	Change	-5	0	11	12	6	0	0	0	0	-14	-24	-12
			% Change	0%	0%	1%	1%	1%	0%	0%	0%	0%	-1%	-1%	-1%
Interior Delta	S Fork Mokelumne River at Terminous	All	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Drought	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	San Joaquin River at San Andreas Landing	All	Change	0	1	3	2	1	0	0	0	1	-7	-8	-4
			% Change	0%	0%	1%	1%	0%	0%	0%	0%	0%	-2%	-2%	-1%
		Drought	Change	-2	0	3	4	2	0	0	0	0	-2	-5	-4
			% Change	0%	0%	1%	1%	1%	0%	0%	0%	0%	0%	-1%	-1%
	San Joaquin River at Prisoner's Point	All	Change	0	0	2	2	1	1	0	0	1	-6	-10	-5
			% Change	0%	0%	1%	0%	0%	0%	0%	0%	0%	-2%	-3%	-1%
		Drought	Change	-3	0	2	4	2	1	1	0	0	-2	-5	-5
			% Change	-1%	0%	0%	1%	0%	0%	0%	0%	0%	-1%	-1%	-1%
Southern Delta	San Joaquin River at Vernalis	All	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Drought	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	San Joaquin River at Brandt Bridge	All	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Drought	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Old River at Middle River	All	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Drought	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Old River at Tracy Bridge	All	Change	-1	0	0	0	0	0	0	0	0	0	-1	-1
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Drought	Change	-1	-1	0	0	0	0	0	0	0	-1	-2	-1
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Change due to CCWD mitigation wheeled primarily through BDCP/CWF Intakes

				Monthly Average Salinity (EC, µS/cm)											
Region	Location	Years	Effect	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Western Delta	Sacramento River at Emmaton	All	Change	2	4	9	6	3	1	1	1	3	-7	-21	-6
			% Change	0%	0%	1%	1%	1%	0%	0%	0%	0%	-1%	-1%	0%
		Drought	Change	-5	1	13	10	5	1	0	0	3	2	-15	-8
			% Change	0%	0%	1%	2%	1%	0%	0%	0%	0%	0%	-1%	0%
	San Joaquin River at Jersey Point	All	Change	0	2	9	6	3	1	1	0	1	-25	-33	-11
			% Change	0%	0%	1%	1%	1%	0%	0%	0%	0%	-2%	-3%	-1%
		Drought	Change	-5	0	11	12	6	1	0	0	-1	-16	-24	-12
			% Change	0%	0%	1%	1%	1%	0%	0%	0%	0%	-1%	-1%	-1%
Interior Delta	S Fork Mokelumne River at Terminous	All	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Drought	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	San Joaquin River at San Andreas Landing	All	Change	0	1	3	2	1	0	0	0	1	-4	-8	-4
			% Change	0%	0%	1%	1%	0%	0%	0%	0%	0%	-1%	-2%	-1%
		Drought	Change	-2	0	3	4	2	1	0	0	0	-2	-5	-4
			% Change	0%	0%	0%	1%	1%	0%	0%	0%	0%	0%	-1%	-1%
	San Joaquin River at Prisoner's Point	All	Change	0	1	2	2	1	1	1	0	1	-4	-8	-5
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	-1%	-2%	-1%
		Drought	Change	-2	0	2	4	2	2	1	0	0	-2	-5	-5
			% Change	0%	0%	0%	1%	1%	0%	0%	0%	0%	-1%	-1%	-1%
Southern Delta	San Joaquin River at Vernalis	All	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Drought	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	San Joaquin River at Brandt Bridge	All	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Drought	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Old River at Middle River	All	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Drought	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Old River at Tracy Bridge	All	Change	-1	0	0	0	0	0	0	0	0	0	-1	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Drought	Change	-1	-1	0	0	0	0	0	0	0	-1	-1	-1
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

31B-2.2.3.2 Alternative 4A (ELT)

Table 30 Water Quality Summary Table for Alternative 4A (ELT)

Alternative 4A (ELT) without mitigaiton

			Monthly Average Salinity (EC, µS/cm)											
Region	Location	Years	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Western Delta	Sacramento River at Emmaton	All	1,675	1,592	1,217	487	363	301	304	482	826	1,346	1,840	2,338
		Drought	2,403	2,436	2,027	676	536	377	341	684	1,162	2,072	2,452	3,701
	San Joaquin River at Jersey Point	All	1,019	1,157	1,305	635	365	307	292	358	549	1,050	1,384	1,737
		Drought	1,509	1,807	1,988	908	471	348	308	450	716	1,598	1,908	2,761
Interior Delta	South Fork Mok at Terminous	All	192	196	201	247	246	230	211	193	192	192	188	186
		Drought	193	194	200	245	261	244	216	201	195	194	189	190
	San Joaquin River at San Andreas Landing	All	410	404	478	363	272	243	251	254	263	326	381	504
		Drought	537	561	678	486	314	260	257	267	276	417	505	753
	San Joaquin River at Prisoner's Point	All	434	407	473	460	394	365	365	320	315	339	370	470
		Drought	539	517	643	567	424	433	411	349	300	394	484	654
South Delta	San Joaquin River at Vernalis	All	502	535	726	674	654	634	411	408	541	588	524	511
		Drought	570	618	810	820	939	915	554	563	636	634	626	610
	SJR at Brandt Bridge	All	503	535	714	682	655	639	433	415	547	597	536	516
		Drought	571	617	794	823	933	922	594	573	646	653	636	616
	Old River at Middle River	All	508	536	720	687	658	642	435	417	548	597	535	516
		Drought	577	619	803	829	936	925	597	576	648	651	635	617
	Old River at Tracy Bridge	All	518	542	710	733	683	663	489	433	515	560	548	528
		Drought	604	635	789	856	938	950	689	595	565	541	602	625

Change due to CCWD mitigation wheeled primarily through Freeport Intakes

				Monthly Average Salinity (EC, µS/cm)											
Region	Location	Years	Effect	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Western Delta	Sacramento River at Emmaton	All	Change	1	3	8	5	2	0	0	0	4	-7	-27	-15
			% Change	0%	0%	1%	1%	1%	0%	0%	0%	0%	-1%	-1%	-1%
		Drought	Change	13	10	6	6	4	0	0	0	9	-9	-27	-11
			% Change	1%	0%	0%	1%	1%	0%	0%	0%	1%	0%	-1%	0%
	San Joaquin River at Jersey Point	All	Change	-1	2	8	5	2	0	0	0	0	-21	-39	-22
			% Change	0%	0%	1%	1%	1%	0%	0%	0%	0%	-2%	-3%	-1%
		Drought	Change	8	8	6	5	4	0	0	0	5	-24	-39	-19
			% Change	0%	0%	0%	1%	1%	0%	0%	0%	1%	-2%	-2%	-1%
Interior Delta	S Fork Mokelumne River at Terminous	All	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Drought	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	San Joaquin River at San Andreas Landing	All	Change	-1	1	3	1	1	0	0	0	0	-2	-7	-6
			% Change	0%	0%	1%	0%	0%	0%	0%	0%	0%	-1%	-2%	-1%
		Drought	Change	2	3	3	2	1	0	0	0	1	-2	-9	-8
			% Change	0%	1%	0%	0%	0%	0%	0%	0%	0%	-1%	-2%	-1%
	San Joaquin River at Prisoner's Point	All	Change	-1	0	2	2	1	0	0	0	0	-1	-6	-7
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-2%	-1%
		Drought	Change	0	2	3	2	1	1	0	0	0	-2	-9	-9
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-2%	-1%
Southern Delta	San Joaquin River at Vernalis	All	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Drought	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	San Joaquin River at Brandt Bridge	All	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Drought	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Old River at Middle River	All	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Drought	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Old River at Tracy Bridge	All	Change	-1	0	0	0	0	0	0	0	0	0	-1	-1
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Drought	Change	-1	0	0	0	0	0	0	0	0	0	-2	-2
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Change due to CCWD mitigation wheeled primarily through BDCP/CWF Intakes

				Monthly Average Salinity (EC, µS/cm)											
Region	Location	Years	Effect	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Western Delta	Sacramento River at Emmaton	All	Change	-3	2	7	5	3	1	1	0	2	-16	-30	-16
			% Change	0%	0%	1%	1%	1%	0%	0%	0%	0%	-1%	-2%	-1%
		Drought	Change	2	2	4	6	4	1	0	0	6	-5	-19	-9
			% Change	0%	0%	0%	1%	1%	0%	0%	0%	0%	0%	-1%	0%
	San Joaquin River at Jersey Point	All	Change	-4	1	6	4	2	1	0	0	-1	-27	-43	-23
			% Change	0%	0%	0%	1%	1%	0%	0%	0%	0%	-3%	-3%	-1%
		Drought	Change	1	1	4	5	4	0	0	0	3	-23	-33	-17
			% Change	0%	0%	0%	1%	1%	0%	0%	0%	0%	-1%	-2%	-1%
Interior Delta	S Fork Mokelumne River at Terminous	All	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Drought	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	San Joaquin River at San Andreas Landing	All	Change	-2	0	2	1	1	0	0	0	0	-3	-8	-7
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	-1%	-2%	-1%
		Drought	Change	0	0	1	1	1	0	0	0	1	-2	-7	-7
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	-1%	-1%	-1%
	San Joaquin River at Prisoner's Point	All	Change	-2	0	2	1	0	1	0	0	0	-2	-7	-8
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	-1%	-2%	-2%
		Drought	Change	-1	0	1	1	1	1	0	0	0	-2	-7	-8
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-1%	-1%
Southern Delta	San Joaquin River at Vernalis	All	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Drought	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	San Joaquin River at Brandt Bridge	All	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Drought	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Old River at Middle River	All	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Drought	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Old River at Tracy Bridge	All	Change	-1	-1	0	0	0	0	0	0	0	0	-1	-1
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Drought	Change	-1	-1	0	0	0	0	0	0	0	0	-2	-1
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

31B-2.2.3.3 Alternative 5A (ELT)

Table 31 Water Quality Summary Table for Alternative 5A (ELT)

Alternative 5A (ELT) without mitigaiton

			Monthly Average Salinity (EC, µS/cm)											
Region	Location	Years	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Western Delta	Sacramento River at Emmaton	All	2,118	2,006	1,201	579	392	293	288	456	796	1,105	1,554	2,066
		Drought	2,933	2,899	1,945	845	550	356	319	647	1,086	1,833	2,247	3,297
	San Joaquin River at Jersey Point	All	1,520	1,772	1,449	812	437	314	280	342	517	1,146	1,261	1,514
		Drought	2,164	2,274	2,024	1,025	554	351	289	428	681	1,624	1,578	2,339
Interior Delta	South Fork Mok at Terminous	All	190	195	199	242	241	226	208	192	192	190	188	186
		Drought	192	194	199	244	257	241	215	200	195	193	191	191
	San Joaquin River at San Andreas Landing	All	476	577	534	411	281	235	235	241	246	340	384	453
		Drought	628	711	698	518	330	248	236	248	265	441	483	635
	San Joaquin River at Prisoner's Point	All	458	558	541	492	363	320	320	296	279	347	387	435
		Drought	582	646	675	585	397	355	333	300	278	423	480	551
South Delta	San Joaquin River at Vernalis	All	502	535	726	676	654	634	412	408	541	588	525	511
		Drought	571	618	811	820	939	915	554	564	636	636	628	611
	SJR at Brandt Bridge	All	503	535	713	687	655	640	436	416	547	597	536	516
		Drought	572	616	793	825	931	924	601	575	646	651	636	617
	Old River at Middle River	All	504	536	720	685	657	640	432	416	548	597	536	517
		Drought	574	618	803	826	936	923	591	575	648	652	638	618
	Old River at Tracy Bridge	All	502	536	710	715	672	654	461	425	516	572	549	529
		Drought	574	615	789	844	937	937	641	585	574	576	617	628

Change due to CCWD mitigation wheeled primarily through Freeport Intakes

				Monthly Average Salinity (EC, µS/cm)											
Region	Location	Years	Effect	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Western Delta	Sacramento River at Emmaton	All	Change	12	8	12	9	2	0	0	0	7	2	-3	12
			% Change	1%	0%	1%	1%	1%	0%	0%	0%	1%	0%	0%	1%
		Drought	Change	14	15	18	11	3	1	0	0	3	0	-5	11
			% Change	0%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%	0%
	San Joaquin River at Jersey Point	All	Change	10	8	12	10	4	1	0	0	4	-12	-10	8
			% Change	1%	0%	1%	1%	1%	0%	0%	0%	1%	-1%	-1%	1%
		Drought	Change	13	14	14	12	5	1	0	0	1	-15	-11	6
			% Change	1%	1%	1%	1%	1%	0%	0%	0%	0%	-1%	-1%	0%
Interior Delta	S Fork Mokelumne River at Terminous	All	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Drought	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	San Joaquin River at San Andreas Landing	All	Change	4	3	5	4	2	0	0	0	1	-1	-2	2
			% Change	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	-1%	1%
		Drought	Change	5	5	6	5	2	1	0	0	0	-3	-3	2
			% Change	1%	1%	1%	1%	1%	0%	0%	0%	0%	-1%	-1%	0%
	San Joaquin River at Prisoner's Point	All	Change	3	3	4	4	2	1	0	0	1	-2	-3	1
			% Change	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	-1%	0%
		Drought	Change	4	4	5	5	3	1	0	0	0	-3	-4	0
			% Change	1%	1%	1%	1%	1%	0%	0%	0%	0%	-1%	-1%	0%
Southern Delta	San Joaquin River at Vernalis	All	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Drought	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	San Joaquin River at Brandt Bridge	All	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Drought	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Old River at Middle River	All	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Drought	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Old River at Tracy Bridge	All	Change	1	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Drought	Change	0	0	0	0	0	0	0	0	0	0	-2	-2
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Change due to CCWD mitigation wheeled primarily through BDCP/CWF Intakes

				Monthly Average Salinity (EC, µS/cm)											
Region	Location	Years	Effect	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Western Delta	Sacramento River at Emmaton	All	Change	10	10	11	8	2	1	0	0	7	2	-3	12
			% Change	0%	0%	1%	1%	1%	0%	0%	0%	1%	0%	0%	1%
		Drought	Change	8	10	17	11	3	1	0	0	3	0	-5	11
			% Change	0%	0%	1%	1%	1%	0%	0%	0%	0%	0%	0%	0%
	San Joaquin River at Jersey Point	All	Change	9	9	11	9	4	1	0	0	4	-12	-10	8
			% Change	1%	1%	1%	1%	1%	0%	0%	0%	1%	-1%	-1%	1%
		Drought	Change	8	9	13	11	5	1	0	0	1	-15	-11	6
			% Change	0%	0%	1%	1%	1%	0%	0%	0%	0%	-1%	-1%	0%
Interior Delta	S Fork Mokelumne River at Terminous	All	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Drought	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	San Joaquin River at San Andreas Landing	All	Change	4	4	4	3	1	0	0	0	1	-1	-2	2
			% Change	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	-1%	1%
		Drought	Change	3	3	5	5	2	1	0	0	0	-3	-3	2
			% Change	0%	0%	1%	1%	1%	0%	0%	0%	0%	-1%	-1%	0%
	San Joaquin River at Prisoner's Point	All	Change	3	3	4	3	2	1	0	0	1	-2	-3	1
			% Change	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%	-1%	0%
		Drought	Change	3	2	4	4	3	1	0	0	0	-3	-4	0
			% Change	0%	0%	1%	1%	1%	0%	0%	0%	0%	-1%	-1%	0%
Southern Delta	San Joaquin River at Vernalis	All	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Drought	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	San Joaquin River at Brandt Bridge	All	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Drought	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Old River at Middle River	All	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Drought	Change	0	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Old River at Tracy Bridge	All	Change	1	0	0	0	0	0	0	0	0	0	0	0
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Drought	Change	0	0	0	0	0	0	0	0	0	0	-2	-2
			% Change	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

in March and April by 3%, and decrease in May and October through February by up to 18% (Appendix 8G, *Chloride*, Figure Cl-19). In Montezuma Slough at Beldon's Landing monthly average chloride concentrations for the 16-year period modeled would increase in December, March and April by 1–2%, and decrease in May, October, November, January and February by 6–10%(Appendix 8G, *Chloride*, Figure Cl-20). Chloride levels in Suisun Marsh are highly dynamic on a sub-daily basis as a result of tidal influences. The changes identified above are small relative to normal day-to-day variability in chloride in Suisun Marsh. For these reasons, any changes in chloride in Suisun Marsh are expected to have no adverse effect on marsh beneficial uses.

The effects of Alternative 4A in the LLT in the Delta region, relative to Existing Conditions and the No Action Alternative (LLT), would be expected to be similar to effects in the ELT. With greater climate change and sea level rise, additional outflow may be required at certain times to prevent increases in chloride in the west Delta. Small increases in chloride concentrations may occur in some areas, but it is not expected that these increases would cause exceedance of Bay-Delta WQCP objectives of cause substantial long-term degradation that would impact municipal and industrial beneficial uses.

SWP/CVP Export Service Areas

Under Alternative 4A in the ELT, long-term average chloride concentrations at the Banks and Jones pumping plants, based on the mass balance analysis of modeling results for the 16-year period, would decrease relative to Existing Conditions. Chloride concentrations would be reduced by 45% at Banks pumping plant (Appendix 8G, *Chloride*, Table Cl-69). At Jones pumping plant, chloride concentrations would be reduced 43% (Appendix 8G, *Chloride*, Table Cl-69). The frequency of exceedances of applicable water quality objectives would decrease relative to Existing Conditions, for both the 16-year period and the drought period modeled (Appendix 8G, *Chloride*, Table Cl-81). The chloride concentration changes relative to the No Action Alternative (ELT) would be similar. Consequently, water exported into the SWP/CVP Export Service Areas would generally be of similar or better quality with regard to chloride relative to Existing Conditions and the No Action Alternative (ELT). Results of the modeling approach which utilized a EC-chloride relationship are consistent these results, and assessment of chloride using these modeling output results in the same conclusions as for the mass balance approach (Appendix 8G, *Chloride*, Tables Cl-70 and Cl-82).

Commensurate with the reduced chloride concentrations in water exported to the SWP/CVP Export Service Area, reduced chloride loading in the lower San Joaquin River would be anticipated which would likely reduce chloride concentrations at Vernalis.

The effects of Alternative 4A in the LLT in the SWP/CVP Export Service Areas, relative to Existing Conditions and the No Action Alternative (LLT), would be expected to be very similar to effects in the ELT. The difference in these timeframes that could contribute to EC differences between the ELT and LLT is climate change and sea level rise, and thus would not be due to the alternative.

Maintenance of SWP and CVP facilities would not be expected to create new sources of chloride or contribute towards a substantial change in existing sources of chloride in the affected environment. Maintenance activities would not be expected to cause any substantial change in chloride such that any long-term water quality degradation would occur, thus, beneficial uses would not be adversely affected anywhere in the affected environment.

***NEPA Effects*:** In summary, relative to the No Action Alternative (ELT and LLT), Alternative 4A would not result in substantially increased chloride concentrations upstream of the Delta, in the

Delta, or in the SWP/CVP Export Service Area on a long-term average basis that would result in adverse effects on the municipal and industrial water supply beneficial use, or any other beneficial use. Additional exceedance of the 150 mg/L and 250 mg/L objectives is not expected, and substantial long-term degradation is not expected that would result in adverse effects on the municipal and industrial water supply beneficial use, or any other beneficial use. Based on these findings, this effect is determined to not be adverse.

***CEQA Conclusion*:** Chloride is not a constituent of concern in the Sacramento River watershed upstream of the Delta; therefore, river flow rate and reservoir storage reductions that would occur under Alternative 4A relative to Existing Conditions, would not be expected to result in a substantial adverse change in chloride levels. Additionally, relative to Existing Conditions, Alternative 4A would not result in reductions in river flow rates (i.e., less dilution) or increased chloride loading such that there would be any substantial increase in chloride concentrations upstream of the Delta in the San Joaquin River watershed.

Relative to Existing Conditions, Alternative 4A would not result in substantially increased chloride concentrations in the Delta on a long-term average basis that would result in adverse effects on the municipal and industrial water supply beneficial use. Additional exceedance of the 150 mg/L and 250 mg/L objectives is not expected, and substantial long-term degradation is not expected that would result in adverse effects on the municipal and industrial water supply beneficial use.

Chloride concentrations would be reduced under Alternative 4A in water exported from the Delta to the SWP/CVP Export Service Areas thus reflecting a potential improvement to chloride loading in the lower San Joaquin River.

Chloride is not a bioaccumulative constituent, thus any increased concentrations under the Alternative 4A would not result in substantial chloride bioaccumulation impacts on aquatic life or humans. Alternative 4A maintenance would not result in any substantial changes in chloride concentration upstream of the Delta or in the SWP/CVP Export Service Areas

Based on these findings, this impact is determined to be less than significant. No mitigation is required. Despite the fact that no mitigation is required, DWR proposed to further reduce any impacts by implementing Mitigation Measure WQ-7e.

Mitigation Measure WQ-7e: Implement Terms of the Contra Costa Water District Settlement Agreement

DWR and Contra Costa Water District (CCWD) entered into a settlement agreement (Agreement) for reducing potential impacts to CCWD water supply in the Delta related to construction and operation of the BDCP/California WaterFix. This mitigation measure includes conveyance of water to CCWD that meets specified water quality requirements, in quantities and on a schedule defined in the Agreement. The Agreement ensures that the quality of the water CCWD delivers to its customers is not impacted as a result of the BDCP/California WaterFix. The Agreement does not increase the total amount of water that CCWD would otherwise be entitled to divert.

DWR would convey mitigation water to CCWD in one of two ways: 1) the primary method of conveying the water would be through the existing Freeport Regional Water Authority Intake (Freeport Intake) and the existing interconnection between EBMUD's Mokelumne Aqueduct and CCWD's Los Vaqueros Pipeline; and 2) the secondary method of conveying the water would be through the BDCP/California WaterFix's northern intakes and new Interconnection Facilities

Chapter 8 – Water Quality	Existing Condition	Alternative: No Action	1A	1B	1C	2A	2B	2C	3	4	5	6A	6B	6C	7	8	9	4A	2D	5A
WQ-5: Bromide (CM1) - Percent increase in long-term average concentration at Barker Slough	-	-2%	38/43%	38/43%	38/43%	22/26%	22/26%	22/26%	34/38%	40/44%	23/27%	19/22%	19/22%	19/22%	-2/1%	4/8%	19/23%	-2/2%	-2/2%	-4/0%
		LTS	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A[a]	S/A[a]	S/A	LTS/NA	LTS/NA	LTS/NA
WQ-7: Chloride - Percent of years when 150 mg/L water quality objective exceeded at CCPP#1[b]	7%	0	13%	13%	13%	13%	13%	13%	7%	7%	13%	13%	13%	13%	20%	13%	13%	0%	0%	0%
		S	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	LTS/NA	LTS/NA	LTS/NA
WQ-11: EC- Percent of days Emmaton objective would be exceeded	6%	14	31%	31%	31%	26%	26%	26%	30%	27-29%[c]	25%	32%	32%	32%	19%	22%	18%	16%[c]	7%[c]	10%[c]
		S	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	S/A	LTS/NA	LTS/NA	LTS/NA
WQ-13: Mercury (CM1) - Maximum percent increase in fish tissue concentrations at Delta locations	6%	6%	8/10%	8/10%	8/10%	13/11%	13/11%	13/11%	6/8%	15/12%	8/7%	64/58%	64/58%	64/58%	45/39%	46/41%	66/59%	8/7%	10/9%	5/3%
		LTS	LTS/NA	LTS/NA	LTS/NA	LTS/NA	LTS/NA	LTS/NA	LTS/NA	LTS/NA	LTS/NA	S/A	S/A	S/A	S/A	S/A	S/A	LTS/NA	LTS/NA	LTS/NA

Notes

[a] While the long-term average increases in bromide would be low, the drought period increases would be 34% for Alternative 7 and 50% for Alternative 8, relative to Existing Conditions and the No Action Alternative. These increases in the drought period were considered significant/adverse.

[b] Water quality degradation as measured by use of available assimilative capacity also played a significant role in determining effects by alternative, and degradation varied by alternative.

[c] Alternative 4 does not include a change in compliance location from Emmaton to Threemile Slough, but the modeling used to evaluate the alternative did include the change. Thus, although the percent of days the Emmaton objective was exceeded is high, it is expected that under the alternative it would be similar to the No Action.

Key

Level of significance or effect **before** mitigation
(Quantity of impact: number of sites, structures, acres, etc. affected)

Increasing level of significance →

Bromide - Percent increase (%)	<0	1 - 20	21 - 40	>40
Chloride - % of years objective exceeded (%)	0	1-12	13-19	>20
EC - percent of days objective exceeded (%)	<10	11 - 20	20 - 30	>30
Mercury (CM1) - Percent increase (%)	<10	10 - 20	21 - 50	>50
Mercury (CM2-CM22) - restoration acres	0	1 - 100	25,000	65,000
Organic Carbon (CM1) - mg/L	<0.1	0.1 - 0.5	0.6 - 1.0	>1.0
Organic Carbon (CM2-CM21) - restoration acres	0	1 - 100	25,000	65,000
Selenium - Exceedance Quotient	0.87	0.88 - 0.93	0.94 - 0.99	>1.0
Microcystis - relative rank	1	2	3	4

Level of significance or effect **after** mitigation
(CEQA Finding / NEPA Finding)

CEQA Finding		NEPA Finding	
NI	No Impact	B	Beneficial
LTS	Less than significant	NE	No Effect
S	Significant	NA	Not Adverse
SU	Significant and unavoidable	A	Adverse

n/a	not applicable
>	greater than
<	less than
≈	about equal to

Continued on Figure 8-0b

00139.14 EIR-EIS Ex Summ 7-25-2016 (tm)

Figure 8-0a
Comparison of Impacts on Water Quality

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact Conclusion After Mitigation	
		CEQA		CEQA	NEPA
WQ-4: Effects on boron concentrations resulting from implementation of CM2–CM21	NAA (LLT), NAA (ELT), 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4A 5A	LTS		LTS	NA
WQ-5: Effects on bromide concentrations resulting from facilities operations and maintenance (CM1)	NAA (LLT), NAA (ELT), 2D, 4A, 5A	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	WQ-5: Avoid, minimize, or offset, as feasible, adverse water quality conditions; site and design restoration sites to reduce bromide increases in Barker Slough	SU	A
WQ-6: Effects on bromide concentrations resulting from implementation of CM2–CM21	NAA (LLT), NAA (ELT), 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4A, 5A	LTS		LTS	NA
WQ-7: Effects on chloride concentrations resulting from facilities operations and maintenance (CM1)	NAA (LLT), NAA (ELT)	S		S	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	S	WQ-7: Conduct additional evaluation and modeling of increased chloride levels and develop and implement phased mitigation actions WQ-7a: Conduct additional evaluation of operational ability to reduce or eliminate water quality degradation in western Delta incorporating site-specific restoration areas and updated climate change/sea level rise projections, if available WQ-7b: Site and design restoration sites to reduce or eliminate water quality degradation in the western Delta WQ-7c: Consult with Delta water purveyors to identify means to avoid, minimize, or offset for reduced seasonal availability of water that meets applicable water quality objectives WQ-7d: Site and design restoration sites and consult with CDFW/USFWS, and Suisun Marsh stakeholders to identify potential actions to avoid or reduce chloride concentration increases in the Marsh	SU	A
	4A	LTS	WQ-7e: Implement Terms of the Contra Costa Water District Settlement Agreement	LTS	NA
	2D, 5A	LTS		LTS	NA
WQ-8: Effects on chloride concentrations resulting from implementation of CM2–CM21	NAA (LLT), NAA (ELT), 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4A, 5A	LTS		LTS	NA
WQ-9: Effects on dissolved oxygen resulting from facilities operations and maintenance (CM1)	NAA (LLT), NAA (ELT), 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4A, 5A	LTS		LTS	NA
WQ-10: Effects on dissolved oxygen resulting from implementation of CM2–CM21	NAA (LLT), NAA (ELT), 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4A, 5A	LTS		LTS	NA

Level of Significance/Determination of Effects:

CEQA

SU = significant and unavoidable (any mitigation not sufficient to render impact less than significant).
S = significant.
LTS = less than significant.
NI = no impact.
B = beneficial.
ND = no determination.

NEPA

A = adverse.
NA = not adverse.
NE = no effect.
B = beneficial.
ND = no determination.

- Changes in monitoring to support project operations.
- Re-initiation of consultation (ESA Section 7) and 2081(b) permit amendment (CESA) to address changes outside of existing authorizations.

Memorandum of Agreement

Commitments to adaptive management and collaborative science will be secured through a MOA between DWR, Reclamation, the public water agencies, CDFW, NMFS, and USFWS. Details of the collaborative science and adaptive management process, including adaptive management decision-making, an organizational structure for adaptive management decisions, and funding for collaborative science will be developed and incorporated through the MOA, as needed.

Possible Operational Scenarios

Under the real time operational decision-making process, as well as the adaptive management and monitoring program, both of which are described above, the RTO team will have flexibility for operations. The RTO team, in making operational decisions, will take into account operational constraints, such as coldwater pool management, instream flow, and temperature requirements. The extent to which real time adjustments that may be made to each parameter (e.g., OMR flow target) shall be limited by the criteria and/or ranges set out in the section describing Scenario H (Alternative 4A). Operations are flexible, so long as they are in compliance with existing and applicable permitting requirements and standards, as may be amended, and any other regulatory and contractual obligations. In addition, following the initial operations, the adaptive management and monitoring program could be used to make long-term changes in initial operations criteria, if appropriate, to address uncertainties about spring outflow for longfin smelt and fall outflow for delta smelt, among others.

For that reason, Appendix 5E, *Supplemental Modeling Requested by the State Water Resources Control Board Related to Increased Delta Outflows,* also presents a broader operational boundary analysis, as well as an additional operational scenario requested by the State Water Board that results in increased Delta outflow and decreased SWP/CVP exports (Modified Alternative 8). As shown in Appendix 5E, the operation of the future conveyance facility under a possible adaptive management range represented by Boundary 1 and Boundary 2 will be consistent with the impacts discussed for the range of alternatives considered in this document (see Appendix 5E, Section 5E.2, for additional information on these boundaries). Boundary 1 and Boundary 2 also encompass the full range of impacts found in the analysis prepared for H1 and H2(as well as H3 and H4). For modeling information on H1 and H2, please see Appendix 11G, *Supplemental Modeling Results at ELT for Alternative 4 at H1 and H2*.

3.7 Environmental Commitments

As part of the project planning and environmental assessment process, DWR will incorporate certain environmental commitments and BMPs into the proposed action alternatives to avoid or minimize potential impacts. These *environmental commitments* refer to design features, construction methods, and other BMPs that have been incorporated as part of the project description to preclude the occurrence of environmental effects that could arise without such commitments in place. These environmental commitments tend to be relatively standardized and are often already compulsory;

they represent sound and proven methods that can avoid or reduce the potential effects of an action—for example, installation of sedimentation barriers and other stormwater protections during grading—in contrast to mitigation measures that would be necessary to be included as part of project approval to offset the environmental effects of the proposed action. Environmental commitments that would be incorporated in the project are described in Appendix 3B, *Environmental Commitments, AMMs, and CMs*. A number of these commitments are similar to one or more of the AMMs described under Section 3.6.2.2, *Measures to Reduce Other Stressors*. Because the AMMs have been specifically designed to avoid and minimize effects on covered species and natural communities, parallel environmental commitments have been identified in order to recognize the capacity of these practices to avoid or minimize potential impacts related to other environmental topics. The full text of these AMMs is included in Appendix 3B, *Environmental Commitments, AMMs, and CMs*. Additional detail about the approach to mitigation is described in Chapter 4, Section 4.2.5.3, *Mitigation Approaches*. DWR will also coordinate planning, engineering, design and construction, operation, and maintenance phases of the Plan with the appropriate agencies.

These environmental commitments apply to BDCP alternatives and non-HCP alternatives and are separate and apart from those Environmental Commitments that are numbered and that are associated with previously described conservation measures (described in Sections 3.3.2.2 and 3.6.3).

3.8 SWP Long-Term Water Supply Contract Amendment

DWR administers the SWP Long-term Water Contracts (Water Contracts), which are central to SWP construction, operation, and funding. In return for the state financing, construction, operation, and maintenance of the SWP facilities, the SWP water contractors contractually agree to repay all SWP capital and operating costs incurred for the water supply and fish and wildlife mitigation features. DWR annually charges its 29 SWP water contractors for costs of construction, operation, and maintenance of the SWP facilities. Various options, or funding methods, could be used separately or together to provide SWP funding for the construction, operation, and maintenance of a new conveyance facility described by any action alternative considered for the BDCP/California WaterFix or for other costs that the SWP contractors would be responsible to fund, such as mitigation for construction of the facility.

One funding method would be to use existing payment provisions of the SWP Water Contracts under which DWR would charge the SWP water agencies for the costs of the conveyance facility. If SWP revenue bonds for the facility were issued, this approach by itself could possibly suffice to provide funding. However, DWR could have interim funding needs pending issuance of revenue bonds, in which case additional funding mechanisms besides the SWP contract could be used. In addition, not all SWP contractors may be willing to accept the charges for the new conveyance and may oppose them without first having an amendment to the water supply contracts as discussed below.

As a second funding method to meet interim or additional funding needs, DWR and SWP and CVP water contractors could enter into funding agreements similar to the funding agreement used for paying the BDCP-Delta Habitat Conservation Plan and Conveyance Program (DHCCP) planning costs.

5E.5 Environmental Effects

The modeling provides important information that is used to determine the similarities of the results to alternatives evaluated in this Final EIR/EIS to understand the potential environmental effects of these scenarios. These similarities are described below, by resource topic as organized for alternatives in this Final EIR/EIS. The scenarios evaluated in this appendix (Boundary 1, Boundary 2, and Scenario 2) assume the same facilities and associated construction as Alternative 4A and therefore, the construction-related impacts of these scenarios is the same as described for Alternative 4A. Consistent with the goals of this analysis, the nature and severity of the impacts generally fall within the range of impacts disclosed under Alternatives 1A and 3 for Boundary 1, Alternative 4H3,Alternative 4H3+, and Alternative 8 for Boundary 2, and Alternative 4H4 and Alternative 8 for Scenario 2. However, the analyses and conclusions derived for each of the scenarios below also relied on other EIR/EIS alternatives as noted in the analyses.

5E.5.1 Boundary 1

5E.5.1.1 Water Supply

Generally, water supply related impacts under Boundary 1 would be similar to or less than the impacts disclosed under Alternatives 1A and 3. During construction of water conveyance facilities, operation of existing SWP and CVP water conveyance would continue. Construction would not affect the timing or amount of water exported from the Delta through SWP and CVP facilities.

The effect of Boundary 1 on end-of-May and end-of-September reservoir storage would be similar to or better than the effect of Alternatives 1A and 3 for all reservoirs except Oroville Reservoir. In Oroville, increases in September storage under both Alternative 1A and 3 would be smaller increases in end-of-September storage under Boundary 1. Because all alternatives result in benefits to end-of-September storage, CEQA conclusions for Boundary 1 would be the same as conclusions for Alternative 1A and 3.

Effects of Boundary 1 on total exports (North Delta and South Delta exports combined) would be similar to effects of both Alternative 1A and 3. Effects of Boundary 1 on South Delta exports would generally be reduced in comparison to effects of Alternative 3 but would be higher, especially during January through May, compared to effects of Alternative 1A. Effects of Boundary 1 on North Delta exports would be consistently greater, or more negative from a water supply perspective, during December through June, averaged over all year types, than effects of Alternative 1A, but would be lower, or more beneficial, during July through November. Effects of Boundary 1 on North Delta exports would be consistently lower (beneficial) than effects of Alternative 3 for all months and water year types, with a few minor exceptions that would not change CEQA conclusions under Alternative 3 based on North Delta exports. Therefore, CEQA conclusions based on reservoir storage would be the same as those under Alternative 3.

5E.5.1.2 Surface Water

There would be no increased risk for flood flows under Boundary 1 compared to Alternative 1A and 3. Further, effects on flood flows in the San Joaquin River would remain consistent under Boundary 1, Alternative 1A and Alternative 3.

Commensurate with the reduced chloride concentrations in water exported to the service area, reduced chloride loading in the lower San Joaquin River would be anticipated which would likely alleviate or lessen any expected increase in chloride at Vernalis related to decreased annual average San Joaquin River flows (see discussion of Upstream of the Delta).

Maintenance of SWP and CVP facilities would not be expected to create new sources of chloride or contribute towards a substantial change in existing sources of chloride in the affected environment. Maintenance activities would not be expected to cause any substantial change in chloride such that any long-term water quality degradation would occur, thus, beneficial uses would not be adversely affected anywhere in the affected environment.

***NEPA Effects*:** In summary, relative to the No Action Alternative conditions, the Alternative 4 H1–H4 Scenarios are not expected to result in substantial additional exceedances of the 150 mg/L or 250 mg/L water quality objectives. All of the Alternative 4 H1–H4 Scenarios would result in increased water quality degradation with respect to the 250 mg/L municipal and industrial objective at western Delta locations on a monthly average basis, and could contribute measureable water quality degradation relative to the 303(d) impairment in Suisun Marsh (see Mitigation Measure WQ-7; implementation of this measure along with a separate, other commitment relating to the potential increased chloride treatment costs would reduce these effects). The predicted chloride increases constitute an adverse effect on water quality. Additionally, the predicted changes relative to the No Action Alternative conditions indicate that in addition to the effects of climate change/sea level rise, implementation of CM1 and CM4 under the Alternative 4 H1–H4 Scenarios would contribute substantially to the adverse water quality effects.

***CEQA Conclusion*:** Key findings discussed in the effects assessment provided above are summarized here, and are then compared to the CEQA thresholds of significance (defined in Section 8.3.2, *Determination of Effects*) for the purpose of making the CEQA impact determination for this constituent. For additional details on the effects assessment findings that support this CEQA impact determination, see the effects assessment discussion that immediately precedes this conclusion.

Chloride is not a constituent of concern in the Sacramento River watershed upstream of the Delta, thus river flow rate and reservoir storage reductions that would occur under any of the Alternative 4 H1–H4 Scenarios, relative to Existing Conditions, would not be expected to result in a substantial adverse change in chloride levels. Additionally, relative to Existing Conditions, the Alternative 4 H1–H4 Scenarios would not result in reductions in river flow rates (i.e., less dilution) or increased chloride loading such that there would be any substantial increase in chloride concentrations upstream of the Delta in the San Joaquin River watershed.

Relative to Existing Conditions, the Alternative 4 H1–H4 Scenarios would not increase the frequency of exceeding the 150 mg/L Bay-Delta WQCP objective. Modeling results indicate that the frequency of exceedance of the 250 mg/L Bay-Delta WQCP objective would increase at the San Joaquin River at Antioch and at Mallard Slough (ranging by up to 2 to 4% for the H1–H4 Scenarios), but these frequencies are expected to be within the uncertainty present in the chloride modeling procedure. Substantial long-term degradation may occur at Antioch under all of the H1–H4 Scenarios, and at the Contra Costa Canal at Pumping Plant #1 under the H1-H2 Scenarios, that may result in adverse effects on the municipal and industrial water supply beneficial use (see Mitigation Measure WQ-7; implementation of this measure along with a separate, other commitment relating to the potential increased chloride treatment costs would reduce these effects). Relative to the Existing Conditions, the modeled increased chloride concentrations and degradation in the western Delta under all of the

evaluation of the project's impacts in the meantime does not 'giv[e] due consideration to both the short-term and long-term effects' of the project … and does not serve CEQA's informational purpose well" (*Ibid*., quoting State CEQA Guidelines Section 15126.2, subd. (a)). Although the Supreme Court did not adopt a strict prohibition against the exclusive use of a future baseline consisting of anticipated conditions at the commencement or mid-point of project implementation, any sole reliance on such a future baseline is only permissible where a CEQA lead agency can show, based on substantial evidence, that an existing conditions analysis would be "misleading or without informational value" (*Ibid*., 457).

Existing Conditions

Although originally formulated prior to the issuance of the *Neighbors for Smart Rail* decision, the CEQA baseline employed in this EIR/EIS is consistent with the principles outlined above. Following CEQA Guidelines Section 15125(a), the CEQA baseline was developed to assess the significance of impacts of the BDCP alternatives in relation to the Existing Conditions at the time of the NOP. The Existing Conditions assumptions for the EIR/EIS include facilities and ongoing programs that existed as of February 13, 2009 (publication date of the most recent NOP and Notice of Intent [NOI] to prepare this EIS/EIR), that could affect or could be affected by implementation of the action alternatives (refer to Appendix 1D, *Final Scoping Report*, for copies of the NOP and NOI).

In some instances, though, certain assumptions were updated within the CEQA lead agency's reasonable discretion. For example, the June 2009 Biological Opinion (BiOp) for salmonid species from National Marine Fisheries Service (NMFS) was included within the CEQA baseline even though it had not been issued in its final form as of February 2009. Because the December 2008 BiOp for the delta smelt from the United States Fish and Wildlife Service (USFWS) was in place as of February 2009, it made sense to also include the NMFS BiOp, which had been released in draft form prior to February 2009. The California Department of Water Resources (DWR) decided that it would have been anomalous to rely on the most current USFWS BiOp with respect to delta smelt issues, but to ignore the soon-to-be-adopted NFMS BiOp with respect to salmonid issues.

Even so, because of the importance of focusing on Existing Conditions, DWR as CEQA lead agency did not assume implementation of *all* aspects of either BiOp. In particular, DWR did not assume full implementation of a particular requirement of the delta smelt BiOp, known as the "Fall X2" salinity standard, which in certain water-year types can require large upstream reservoir releases in fall months of wet and above normal years to maintain the location of "X2" at approximately 74 or 81 river kilometers inland from the Golden Gate Bridge. As of spring 2011, when a lead agency technical team began a new set of complex computer model runs in support of this EIR/EIS, DWR determined that full implementation of the Fall X2 salinity standard as described in the 2008 USFWS BiOp was not certain to occur within a reasonable near-term timeframe because of a recent court decision and reasonably foreseeable near-term hydrological conditions. As of that date, the United States District Court has not yet ruled in litigation filed by various water users over the issue of whether the delta smelt BiOp had failed to sufficiently explain the basis for the specific location requirements of the Fall X2 action, and its implementation was uncertain in the foreseeable future. This uncertainty, together with CEQA's focus on Existing Conditions, led DWR to the decision to use a CEQA baseline without the implementation of the Fall X2 action. However, for the purposes of the NEPA comparison, which uses a different method for assessing environmental effects of the action alternatives, the Fall X2 action is included in the NEPA point of comparison as discussed below in the *No Action Alternatives* section.